Report

Phase III – Comprehensive Wastewater Management Plan and Final Environmental Impact Report

Nantucket, Massachusetts

Volume I of III

Prepared for:

Nantucket Department of Public Works
188 Madaket Road
Nantucket, Massachusetts 02554-2623

Prepared by:

Earth Tech, Inc.
196 Baker Avenue
Concord, Massachusetts 01742-2167

March 2004

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March 31, 2004

Dear Project Reviewer:

Enclosed please find one copy of the report entitled "Comprehensive Wastewater Management Plan and Final Environmental Impact Report Phase III (Phase III Report) completed in accordance with the Massachusetts Department of Environmental Protection's "Guide to Wastewater Management Planning" dated January 1996. The review of the Comprehensive Wastewater Management Plan (CWMP)/Environmental Impact Report (EIR) will be through the submission of three documents including: (1) Phase I Report; (2) Phase II CWMP/Draft EIR; and (3) Phase III CWMP/Final EIR.

This Phase III Report is consistent with the general requirements of the MEPA regulations including being circulated per MEPA regulations at 301 CMR 11.16 (3). In addition, six (6) copies will be available for public review at the Selectmen and Town Clerk's Offices in the Town Hall, Department of Public Works, Nantucket Land Council, Nantucket Planning and Economic Development Commission and at the Antheneum (Public Library). The complete Report can also be accessed through the Town's website at www.nantucket-ma.gov. The circulation list is included in Section 7 of the Phase III Report.

A public hearing on the Phase III Report will be initiated by a notice of availability for review in the Environmental Monitor. A responsiveness Summary will be completed as a result of the Public Hearing and included in the permanent record.

If you have questions regarding this project, please do not hesitate to contact the MEPA office at 617-626-1000.

Very truly yours,
Earth Tech, Inc.

Thomas E. Parece, P.E.
Senior Program Director

enclosures

Table of Contents

TABLE OF CONTENTS

Page

Section

LIST OF FIGURES

LIST OF TABLES

Table **Page**

Executive Summary

EXECUTIVE SUMMARY

In 1998, the Nantucket Department of Public Works retained Earth Tech, Inc. to prepare an Island-wide Comprehensive Wastewater Management Plan/Environmental Impact Report (CWMP/EIR) to identify areas within the Island with sub-surface wastewater disposal problems and to develop a plan to mitigate or eliminate the problems. The Town established a special procedure for the review of this major and complicated project. This special procedure is a three-phase process during which the scope of future phases is based largely on the results of the preceding phase. The process consists of filing three documents: (1) Phase I, Needs Analysis; (2) Phase II, Alternatives and Site Identification and Draft Environment Impact Report; and (3) Phase III, Comprehensive Wastewater Management Plan and Final Environmental Impact Report. The results of the three-phase plan are included in this Document. This Document provides the basis for the design and ultimate implementation of the approved plan.

This Document contains the results of extensive efforts by Earth Tech, Inc. and the Town of Nantucket to evaluate the available options for improving the existing on-site wastewater disposal systems. In order to obtain as much information as possible on the existing and projected land use, demographic conditions and population, Earth Tech Inc., coordinated efforts with the Nantucket Planning and Economic Development Commission (NP&EDC) and the Massachusetts Estuary Project (MEP). The goals of the NP&EDC's, "The Nantucket Comprehensive Plan", coupled with the on-going Massachusetts Estuary Project (MEP) have been utilized in evaluations and analyses for the community presented in this Document and have been an integral force in the formation of the final recommendations herein.

The MEP is currently gathering data in the Nantucket Harbor and Sesachacha Pond areas in order to provide technical data relative to the maximum amount of nitrogen (nitrogen threshold) that each estuary can tolerate without adversely changing its character and use. Madaket Harbor is also being studied but at a different target date than the above-mentioned areas. MEP will set the target to be achieved in order to protect and restore the health of the estuaries. Study areas affected by the MEP include Wauwinet, Quidnet, Pocomo, and Polpis. Until the MEP data is completed, these areas are recommended to continue using on-site wastewater disposal systems managed under a Septage Management Plan. Once the MEP data is complete, these areas will be further evaluated for long-term recommendations.

A recommended solution is being made for Madaket in this Report, which has been classified as a Need Area based on multiple criterion identified in the Phase I Report. The MEP in the Madaket Harbor area will further define the need for reducing nitrogen loadings to the estuaries here. This could mean redefining the wastewater treatment level necessary to meet the goals of the MEP in Madaket. The CWMP/EIR is an evolving and acquiescent process. It is recommended that the Town continue the coordination of efforts on Island with the MEP.

Other agencies utilized for information and considered herein are U.S. Soils Conservation Services, U.S. Department of Agriculture, U.S. Coast Guard, local planning officials, the Nantucket Historic Commission, the Natural Heritage Program, and local Town boards including Assessors, Building Department, Board of Health, Public Works Department, Zoning Officials, Conservation Commission and Nantucket Planning and Economic Development Commission.

The Phase I, Needs Analysis was completed and filed with MEPA in August 2001. An Environmental Notification Form (ENF) was filed with MEPA in October of 2001. The Phase I Document determined the areas on Island incapable of sustaining long-term, on-site wastewater disposal systems throughout and beyond the 20-year planning period. There were ten Study Areas identified as Needs Areas:

Madaket
Monomoy
Pocomo
Polpis
Quidnet
Shimmo
Pocomo
Polpis
Warrens Landing
Wauwinet

See the map at the end of this Executive Summary for a description of the challenges and solutions for each of the ten identified Study Areas.

The Phase II, Alternatives and Site Identification, was completed and filed with MEPA in September 2003. The Phase II Document analyzed the selected alternatives in accordance with the revised scope that was issued by the Secretary of EOEA and comments received on the Phase I CWMP/EIR document.

The Phase II CWMP/DEIR document contains the preliminary investigation into the viability of siting wastewater treatment facility(s) and/or highly treated wastewater effluent disposal facilities on Nantucket. Site selection, for both the wastewater treatment facilities (WWTFs), and the effluent disposal field(s) is the most difficult to resolve. The screening criteria presented in this section were developed to assess the

viability of 14 sites identified within Nantucket as potential wastewater treatment facility and/or wastewater disposal facility sites. The screening criteria used to evaluate these potential project sites were based upon eleven environmental criterion. The environmental screening criteria were chosen based upon review by the Project Proponent and upon comments received by the Proponent in the Secretary of the Executive Office of Environmental Affairs Certificate on the ENF dated October 2001. It was determined that by applying the screening criteria to the 14 identified sites a short list of selective potential sites would be established for additional evaluation through field testing. The screening criteria chosen to evaluate the potential project sites are: (1) wetlands; (2) soils; (3) drinking water supply - wellhead protection areas (Zone I and Zone II); (4) fisheries (including shellfish areas); (5) waterbodies (distance from surface water); (6) floodplains; (7) sensitive habitats; (8) park lands; (9) recreational resources;
(10) agricultural/historical interests; (11) shoreline change data; and (12) in or adjacent to an Area of Critical Environmental Concern.

Wastewater treatment options were evaluated based on four levels of criteria. The first criterion, Technical Factors, included flow and loading, land/site requirements, suitability for groundwater discharge, climate, sludge disposal and ease of operation. The second criterion, Environmental Factors, included groundwater and permitting impacts. The third criterion, Institutional Factors, included community acceptance, regulatory and legal issues. The fourth criterion, Economic Factors, included construction cost and operations cost. Various wastewater treatment technologies were evaluated based on the above criteria and the Town of Nantucket's goals regarding the operation and maintenance of the facilities.

The Phase II CWMP/DEIR document presents recommendations for wastewater management in the above-mentioned ten identified areas of the Town of Nantucket where existing on-site wastewater disposal systems are shown to be inadequate for long-term wastewater disposal. Specific recommendations by Study Area have taken into account the appropriateness of utilizing: (1) innovative alternative systems; (2) communal systems; and (3) local wastewater collection, treatment, and disposal facilities. The Phase II CWMP/DEIR document evaluated the environmental impacts, technical design, institutional factors, and project costs associated with each alternative and recommends the appropriate solution to the wastewater disposal problems in the Town of Nantucket on a long term basis, with the exception of those areas included in the MEP Study Areas.

The Phase II CWMP/DEIR document recommends that the Town of Nantucket upgrade the existing Surfside Wastewater Treatment Facility, construct a new Madaket Wastewater Treatment Facility and provide sanitary sewer via low pressure sewers and/or gravity sewers to five needs areas (Madaket, Monomoy, Shimmo, Somerset and Warrens Landing), and to prepare a Septage Management Plan for the remainder of the Island. The recommended plan is the most environmentally sound and cost-effective alternative, and insures the sustainability of Nantucket's water resources for centuries to come. The recommended plan is proposed to be designed and constructed over a twelve-year period and has been divided into seven construction phases. The construction phases were developed based on: (1) the need of an area to be serviced; (2) funding constraints; and (3) minimizing construction related disruptions within the Town. The capital cost of the recommended plan is estimated at $92.1 million and includes construction, engineering (design and construction), legal, fiscal, administrative, and contingency costs for providing sanitary sewerage to the five needs areas, and the construction of the Surfside WWTF upgrade and Madaket WWTF. The CWMP/EIR is a dynamic and flexible long-term planning document, therefore, the Town has the opportunity to incorporate any additional information that is developed by Federal, State and/or Local authorities and/or private entities prior to the implementation of the recommendations, if appropriate.

The Secretary issued the MEPA Certificate for the Phase II, EOEA Number 12617, on December 1, 2003.

After filing the Phase II CWMP/DEIR on October 30, 2003, the Town of Nantucket entered into an Administrative Consent Order (ACO), ACOP-BO-03-1G002, with the DEP in the matter of the Surfside Wastewater Treatment Facility. The implementation schedule contained in this Phase III Document coincides with the schedules detailed in the ACO. The complete ACO is included in Appendix A.

In addition to the CWMP/EIR, the Town has been involved with an Evaluation and Mapping project for its wastewater and stormwater infrastructures. The project involves the review, investigation and mapping of the infrastructures and recommended rehabilitation/upgrades required based on existing and future needs. The capital cost of the recommended plan is estimated at $83.4 million and includes construction, engineering (design and construction), legal, fiscal, administrative, and contingency costs over a 20-year planning period. One of the major parts of the Evaluation and Mapping project is the initial investigation of infiltration/inflow within the existing wastewater infrastructure and recommendations to reduce excessive groundwater from entering the wastewater collection system. Since the Evaluation and Mapping project is scheduled to be completed in the Summer of 2004, adjustments to the recommendations and associated estimated capital costs may be necessary.

This Phase III, Comprehensive Wastewater Management Plan and Final Environmental Impact Report (CWMP/FEIR) is the final result of all comments received on the Phase II Report through the MEPA process as well as comments received during multiple public informational meetings and workshops held on the Island and incorporates the provisions contained in the Surfside ACO. The Phase III, CWMP/FEIR, contains the final recommended plan for long-term wastewater collection, treatment and disposal as well as all associated costs for users and non-users. A Septage Management Plan is completed in draft form for those areas on Island determined to be long-term sustainable with on-site wastewater disposal systems.

These projects have spearheaded the Town's efforts to develop a long-term Capital Improvement Program that incorporates not only the recommendations from the CWMP/EIR and Evaluation and Mapping projects, but other Town Department budget expenditures as well. This proactive agenda will allow the Town to act fiscally responsible and ensure the long-term sustainability of the Island while protecting the environment and sole source aquifer at the same time both of which are direct goals the State's Watershed Initiative.

In summary, both the CWMP/EIR and Evaluation and Mapping projects are dynamic and flexible long-term planning documents that leave opportunities open to modifications by the Town to incorporate any additional information that is developed by Federal, State and/or Local authorities and/or private entities prior to the implementation of the recommendations, if appropriate.

Challenge:
Evaluate alternatives for a 20-year solution to wastewater collection, treatment and disposal needs of the Town.

Solution:
An Island-wide study to maintain and/or improve environmental conditions while determining costs, benefits for long-term sustainability, protection of the sole source aquifer and public health, and preservation of Nantucket Harbor, Madaket Harbor, Polpis Harbor and Sesachacha Pond.

Area of Wastewater Disposal Need Based on Wellhead Overlay Protection Zone

Town WPZ
Challenge
- Wellhead Protection Zone
- Private Water Supply & Wastewater Disposal

Solution
- Connect into Existing Wastewater System

Area of Wastewater Disposal Need Based on Harbor Watershed Line

Pocomo
Challenge
- Nantucket Harbor Watershed
- High Groundwater
- Private Water Supply & Wastewater Disposal

Solution
- Septage Management Plan

Monomoy
Challenge
- Nantucket Harbor Watershed
- Private Water Supply & Wastewater Disposal

Solution
- Connect into Existing Wastewater System

Shimmo
Challenge
- Nantucket Harbor Watershed
- Private Water Supply & Wastewater Disposal

Solution
- Connect into Existing Wastewater System

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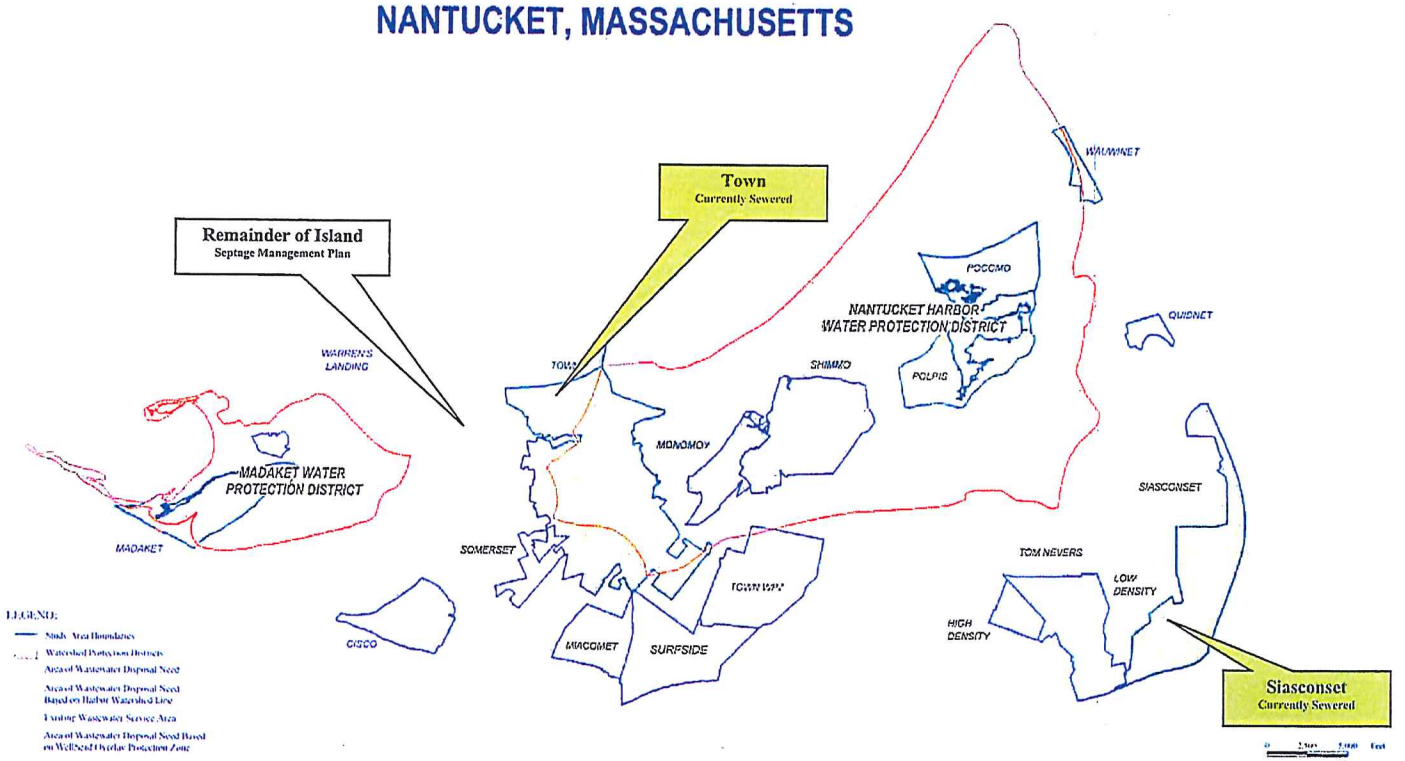
COMPREHENSIVE WASTEWATER MANAGEMENT PLAN NANTUCKET, MASSACHUSETTS



Area of Wastewater Disposal Need

Madaket
Challenge
- Small Dense Lots
- Madaket Harbor Watershed
- Private Water Supply & Wastewater Disposal

Solution
- Decentralize Wastewater Treatment

Polpis
Challenge
- Nantucket Harbor Watershed
- Degradation of Polpis Harbor
- High Groundwater
- Private Water Supply & Wastewater Disposal

Solution
- Septage Management Plan

Quidnet
Challenge
- Topography
- Small Dense Lots
- Private Water & Wastewater Disposal

Solution
- Septage Management Plan

Somerset
Challenge
- Small Dense Lots
- Private Water & Wastewater Disposal

Solution
- Connect into Existing Wastewater System

Warrens Landing
Challenge
- Madaket Harbor Watershed
- Small Dense Lots
- Private Wastewater Disposal

Solution
- Decentralize Wastewater Treatment

Wauwinet
Challenge
- Small Dense Lots
- Private Water Supply & Wastewater Disposal

Solution
- Septage Management Plan

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Date Prepared: June 2003 (Revised: March 2004)